Construction Cone Drawing: Taper, Bands, and Square Base

Original tasks 1, 2, 3 / complete keys

Task 1

Front view: height 8 units, base width 4 units, top width 1 unit, bands at 25 percent and 75 percent, thickness 0.5 unit. Describe the drawing and give the band center heights.

Answer: Trapezoid with base half-width 2 and top half-width 0.5. Base rectangle width 4, depth 1. Band centers at 2 units and 6 units above baseline.

Reason: Height times fraction gives band centers: 8 times 0.25 equals 2; 8 times 0.75 equals 6. Half-widths come from dividing base and top widths by 2.

Check: Measure band centers from baseline and divide by 8; results should be 0.25 and 0.75 within one grid square.

Task 2

Angled view: height 12 units, base width 6 units, top width 2 units, bands at 40 percent and 70 percent. Describe the base shape and band center heights.

Answer: Base is a parallelogram with opposite sides parallel; width 6 and depth 2. Band centers at 4.8 units and 8.4 units above baseline.

Reason: 12 times 0.4 equals 4.8; 12 times 0.7 equals 8.4. The angled base keeps parallel opposite sides rather than a rectangle.

Check: Confirm opposite base sides are parallel and band centers divided by height give 0.4 and 0.7.

Task 3

Scale check: a cone has height 9 units and base width 3 units. What is height divided by base width? If top width is 1 unit, what is top divided by base?

Answer: Height divided by base width is 3. Top divided by base is about 0.33.

Reason: 9 divided by 3 equals 3; 1 divided by 3 is approximately 0.33. These ratios help compare drawings at different sizes.

Check: Recompute with a calculator or by hand and compare to the drawn proportions using the same units.

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Original tasks 4 / complete keys

Task 4

Band placement: height 10 units, bands at 20 percent and 80 percent, thickness 1 unit. Give the lower and upper edges of each band.

Answer: Lower band edges at 1.5 and 2.5 units; upper band edges at 7.5 and 8.5 units above baseline.

Reason: Centers are 2 and 8 units. Subtract and add half the thickness, 0.5, to get edges.

Check: Measure each edge from baseline; center of each pair should equal height times the fraction.

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Source rubric / reflection

- [ ] Taper is even: left and right side distances from center match at base and top.
- [ ] Base is square in perspective: opposite sides parallel and equal in angled view.
- [ ] Two bands are placed at the stated fractions of height within the chosen tolerance.
- [ ] Units are consistent and labeled.
- [ ] Drawing includes only the cone, bands, and base, with no extra road scene or equipment.

Reflection: What did you check, what did you change, and what will you try next?